



Battle for the enterprise edge: Providers prepare to pounce on the emerging enterprise edge computing market

Cloud, telco, equipment, and platform companies are vying for a share of enterprise investments in edge services and products that make computing faster, safer, and cheaper.

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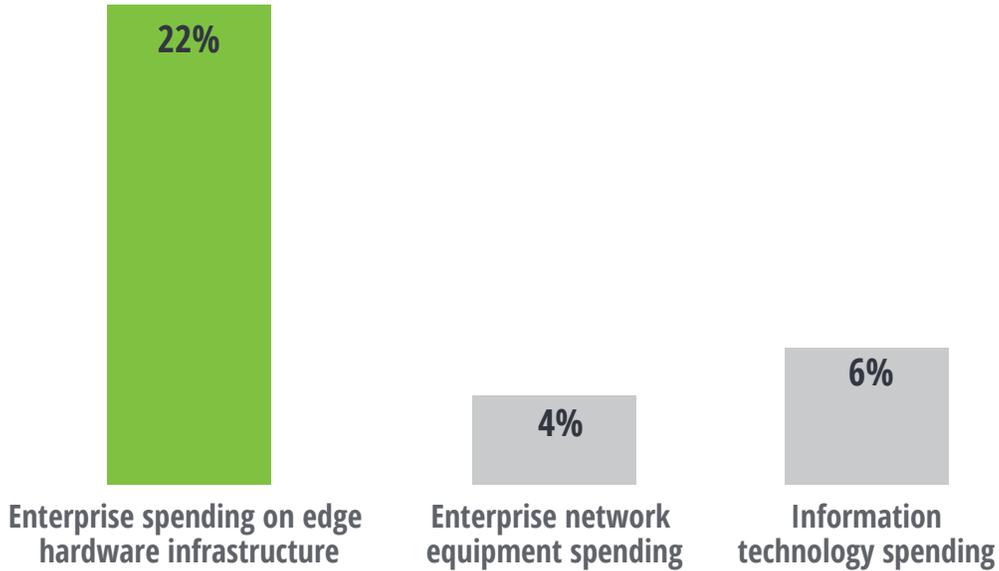
THE ENTERPRISE EDGE is fast becoming the new frontier of digital transformation, and the size of the prize is sending companies of all types—public cloud hyperscalers, communication service providers, infrastructure equipment manufacturers, management platform providers, and others—scrambling for a piece of the growing pie. Deloitte Global examined the edge as a compelling opportunity in its 2021 *Predictions* publication.¹ Some of the headwinds we identified then have slowed the market's evolution and the willingness of enterprises to invest. As the market

develops, a clearer view of the major players' offerings and strategies has emerged and Deloitte Global predicts that the enterprise market for edge computing will grow at 22% in 2023,² compared to 4% growth in spending on enterprise networking equipment and 6% on overall enterprise IT for the same year.³ Most of this growth will likely come from expenditures on hardware initially but will migrate toward software and services as the market matures. While enterprise spending on edge computing is gaining traction, it is off a relatively small base.

FIGURE 1

Growth in enterprise edge infrastructure spending is far outpacing growth in network equipment and overall IT spending

Estimated market growth rates in 2023



Source: Based on Deloitte analysis of IDC, Gartner, Omdia, TBR, HPE, AvidThink, Precedence Research, Grandview, and STL forecasts.

As enterprises pursue edge computing's benefits, providers are eager to oblige

Billions of devices connect to the internet: smartphones, computers, security cameras, machine sensors, and many more. Devices like these generate massive amounts of data, most of which travels over the internet to applications running in the cloud. The cloud, in turn, is powered by enormous, centralized data centers and platforms operated and offered by a few organizations.

The problem with this is that, as the number of connection points explodes to 150 billion devices generating 175 zettabytes of data by 2025,⁴ sending all that data to faraway clouds for processing will become increasingly inefficient and expensive. Moreover, this model may not be able

to deliver the real-time data and response times demanded by newer applications. Consequently, more organizations are considering a hybrid cloud model that augments existing cloud strategies with edge computing.

Edge computing distributes the cloud's scalable and elastic computing capabilities closer to where devices generate and consume data. These locations can be as varied as an enterprise's on-premise server, a communication service provider's central office or cell tower, a hyperscaler's regional data center, an end-user device, or any point in between.

Since data doesn't have to travel as far, using edge computing can help reduce network resources, cut transit costs, improve reliability, reduce latency,⁵ and, perhaps most importantly, enhance enterprise control over data and applications.

For example, edge computing can help organizations meet increasingly stringent data sovereignty, privacy, and security requirements by keeping sensitive data on premise. What’s more, when edge computing is combined with advanced connectivity options—especially 5G—it can deliver flexible, near real-time response times for data-heavy, artificial intelligence–driven, time-sensitive, or mission-critical applications. The combination of low latency, advanced connectivity, and enhanced data control makes many IoT use cases, such as the video analytics and computer vision used in security and quality control, immersive

mixed reality training, autonomous vehicles, and precision robotics, much more feasible.

The developing edge computing ecosystem is highly diverse. While chipset makers, device manufacturers, application developers, security specialists, and system integrators also feature prominently, we’ll focus on four categories of companies that are active in the edge computing market: public cloud hyperscalers, communications service providers (CSPs), infrastructure equipment vendors, and cloud management platforms.

FIGURE 2

Players in the edge computing market face a crowded field

Notable companies in the edge computing value chain

| | |
|---|---|
| Public cloud hyperscalers | <ul style="list-style-type: none"> • Amazon Web Services (AWS) • Microsoft Azure • Google Cloud |
| Communication service providers | <ul style="list-style-type: none"> • Telstra • Verizon • KDDI • SK Telecom • T-Mobile • Orange • Telenor • Telefónica • AT&T • Vodafone |
| Infrastructure equipment vendors | <ul style="list-style-type: none"> • Dell • Nokia • Cisco • JMA Wireless • Mavenir • Ericsson • Hewlett Packard Enterprise (HPE) |
| Edge cloud management platforms | <ul style="list-style-type: none"> • Red Hat • VMware • Nutanix • MobiledgeX • Amdocs |

Source: Multiple public sources.

Public cloud hyperscalers. Hyperscalers are likely to play a key role in standardizing, simplifying, and commercializing enterprise edge computing solutions, leveraging their platforms, ecosystems, and marketplaces to deliver easy-to-consume, right-sized, yet scalable and affordable solutions. Hyperscalers are treating edge computing as an extension of their existing cloud business, regionalizing and scaling their massive global cloud infrastructures into smaller formats that can enable customers to process workloads closer to or in their facilities. As part of this effort, many are partnering with CSPs, content delivery networks, cell tower owners, and others with highly distributed network facilities to colocate these scaled-down edge cloud platforms close to potential clients. Some hyperscalers are shrinking their cloud platforms even further to deliver turnkey edge computing platforms that enterprise customers can deploy on their own hardware infrastructure in their own environments. To pursue this market, they are partnering with specialized system integrators and others to extend their sales channels into specific industry verticals.

CSPs. CSPs are also well-equipped to offer packaged edge computing solutions. Besides providing the connectivity between the hyperscaler's centralized cloud and the enterprise's on-premise data centers, servers, or devices, a number of them believe that they can also profit from offering edge computing solutions in conjunction with secure and reliable connectivity to enable real-time applications. These CSPs are taking measured steps toward developing their edge computing infrastructures, platforms (often in conjunction with a hyperscaler), and services, collectively known as multi-access edge computing (MEC).⁶ As part of a MEC offering, CSPs can use their 5G networks to deliver a wide range of à la carte or fully managed connectivity, compute, storage, and security edge services, or even develop their own B2B and B2C applications tailored to an enterprise's specific needs.

Many CSPs have well-established relationships, credibility, and trust with enterprise customers on which to build their MEC business. On the other hand, many still need to develop their strategy, value proposition, business and operating models, partnerships, and customer-centric sales capabilities to effectively offer and deliver these services.

Infrastructure equipment vendors. For infrastructure equipment vendors, edge computing provides more opportunities to supply service providers, since the increasingly virtualized and open (based on common standards) nature of networks is lowering barriers to entry and allowing for greater vendor diversity. As Dell CEO Michael Dell recently observed, "There are seven million cellular base stations worldwide, and every one of those is becoming a data center"⁷—presumably to which Dell intends to supply edge infrastructure solutions. Indeed, at Mobile World Congress 2022 (MWC 2022), not only Dell but HPE, Cisco, and other IT hardware vendors announced new edge-to-cloud computing solutions for CSPs and enterprise customers.

In pursuing these new opportunities, many IT equipment vendors are evolving their increasingly commoditized hardware-centric product portfolios into more value-added, software-centric, and consumption-based business models. An example of this trend is HPE, which in 2018 committed more than US\$4 billion to build its edge computing business around the cloud and service-based business model that it announced at MWC 2022.

Networking infrastructure vendors are also getting in the game. Given greater spectrum availability, common architectures, and use case requirements, edge computing and private cellular networks are often implemented concurrently. Accordingly, the markets for edge computing and private cellular networks are developing hand in hand, leading to partnerships up and down the tech stack and across the value chain. Because cellular networks require a different skill set from edge computing,

these combined deployments expand revenue opportunities for networking infrastructure vendors with specialized knowledge of radio technologies.

Edge cloud management platforms. Because edge computing has numerous deployment options, each involving a different slate of vendors and applications, an abstraction layer—that is, an edge-cloud management platform—can be used to reduce the complexity of administering these disparate, heterogeneous environments. These management platforms increasingly seek to provide a common operating system with centralized tools, KPIs, and dashboards, making it

easier for operators, enterprises, and developers to tailor performance and security policies in diverse, hybrid environments. The programmable platforms use application programming interfaces (APIs) to control the underlying physical network infrastructure. Because these APIs are increasingly becoming standardized, open-source, and thus vendor-agnostic, their use promotes greater interoperability among the mix-and-match components from different vendors. They can also increasingly blur the distinction between infrastructure and applications as network functions and capabilities are increasingly implemented through code rather than infrastructure.

THE BOTTOM LINE

While the market for edge computing products and services is potentially huge, providers may have to wait a while for customers to catch up. Many enterprises and other organizations are rethinking their cloud, data center, and networking strategies for how best to take advantage of new edge computing capabilities. In doing so, they are evaluating where to best place workloads in a hybrid cloud/edge model—and how they can secure and access data in a data center that exists at the core, cloud, and edge.

Inevitably though, enterprises will likely solve these kinds of issues and increase their edge computing investments. And as they do, the various providers' success in capturing share may depend not on an "us versus them" mentality, but rather on working together to realize the market's potential. Telcos, hyperscalers, equipment vendors, and platform providers may often find themselves serving the same customers, each providing a different value proposition. Natural synergies will often arise in consequence—for instance, many cross-industry partnerships are forming to offer enterprises a wide range of integrated compute and networking solutions to support turnkey computer vision, virtual and augmented reality, machine learning, and other data-intensive or connected-device applications.⁸ For this reason, it's safe to say that the edge computing business will likely rely on partnerships and ecosystems and not on end-to-end solution providers in every case.

Endnotes

1. Chris Arkenberg et al., *Gaining an intelligent edge: Edge computing and intelligence could propel tech and telecom growth*, Deloitte Insights, December 7, 2020.
2. Based on Deloitte analysis of IDC, Gartner, Omdia, TBR, HPE, AvidThink, Precedence Research, Grandview, and STL forecasts.
3. Mikayla Gruber, "Gartner predicts IT spending growth despite economic strife," SDxCentral, July 16, 2022.
4. Hewlett Packard Enterprise (HPE), "Hewlett Packard Enterprise to present live webcast of Investor Relations Summit at HPE Discover 2022," press release, June 22, 2022.
5. Latency is the amount of time, typically measured in milliseconds (ms), to roundtrip data between two points.
6. The European Standards board, ETSI, developed the standard software platform, API, and programming model that define how edge applications interact primarily with the cellular RAN.
7. YouTube, "Michael Dell: Edge is the new cloud.," video, 5:43, June 9, 2021.
8. Carl Weinschenk, "Verizon, Google cloud partner on 5G mobile edge computing," Telecompetitor, December 16, 2021.

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